POWER RATES – THE EFFECTS ON MANUFACTURING

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What I am going to tell you is a unhappy story with an unhappy ending.

I'm going to talk to you about electricity costs and pricing in Ontario, and their impact on industry.

We need to remember that what made the Golden Horseshoe "Golden" was the development of hydro electric power generation at Niagara Falls...and the inexpensive electricity that Ontarians enjoyed for decades.

To this day, most people in Ontario still refer to electricity as "hydro".

Sir Adam Beck was the first Chairman of the Ontario Hydro Electric Power Commission and the man credited with the development and distribution of hydro electric power in Ontario.

Sir Adam Beck would turn over in his grave if he could see the state we are in today.

As many of you know, I am an owner and President of the Bowmanville Foundry. We are a very large electricity user in Clarington. Today we purchase around $40k of electricity per month.

I'm going to start with a little story about how I came to understand the train wreck that Ontario's electricity generation system has become.

Almost 12 years ago something called the Provincial Benefit showed up on our electric bills at the foundry. It was small…

maybe +/- a few hundred dollars on a very complex bill that usually totalled $20k/month at that time. I paid little attention to it.

But then one month it was a nearly $1,200 surcharge, then the next month it was$1,500. I immediately called our utility (Veridian Connections) to have it explained... and I got no response

The following month, the "Provincial Benefit" was over $2,000!!! Now we were approaching 10% of our total monthly electricity bill and I was very concerned. I asked my accounts payable clerk to deduct the amount from our payment, and I wrote a nice cover letter saying that I really needed an explanation of what the Provincial Benefit was and how it was calculated before I could pay that portion of the bill.

All the other lines on our bill were itemized by kw demand and kwhrs usage multiplied by specified rates etc.. The PB just said Provincial Benefit...and an amount, no background calculations at all.

I wrote in my letter that the undefined PB was a problem for us when attempting to carefully manage our demand and the time of day we peaked our power usage.

My utilitiy's swift response was to email us a notice of disconnection for failing to pay the bill in full.

I thought this was kind of heavy handed...given we had paid our bills every month, in full, on time for over 100 years and they wanted to disconnect us for one short payment. Further

they still didn't give us an explanation for this new charge that was now running into thousands of dollars per month.

Now it just so happens I am good friends with the gentleman who was the CFO of the utility at the time, however I decided that I wouldn't use our friendship to get this resolved, I decided to let it play out.

I replied to the disconnection email, noting that they had given a disconnection date, but not a specific time.

I asked what time their crew would be out to disconnect us. I needed to know this because I wanted to have the Union leaders from the USW who represent the workers who would lose there jobs, and I wanted the press there for the closing of the 110 year old Bowmanville Foundry.

About a day later I got a phone call from my friend, the CFO of the utility. "OK Mike, you got our attention".

He explained to me what the Provincial so-called "Benefit" was. And I quote…

"The Provincial Benefit pays for the difference between the wholesale market price and the rates paid to regulated and contracted generators for electricity in Ontario"

Let me explain that....

Electricity is traded on the grid system in North America as a commodity, and its price goes up and down with supply and demand. As with any commodity in an open market, If the demand goes down, the price goes down.

At that time, North America was heading into the "great recession", factories were closing or cutting back shifts, electricity demand was down, thus the market price was down.

However, the Ontario government had contracted to buy electricity at fixed rates that were now well above the market rate.

At the time Ontario was paying OPG around 5-6 cents per kwhr for electricity, while the market rate was less than 3 cents per kwhr.

Industrial rate payers were having to make up the difference through the "Provincial Benefit"

...one would ask "benefit to who?"

This pricing scheme has a number of perverse side effects:

<u>First…</u> During a recession, our industrial competitors in other jurisdictions are able to enjoy the very low electricity rates caused by low demand, while in Ontario, we were being surcharged the PB on top of the market rate in order to subsidize the contracted generators in Ontario. So, at a time when Ontario industry needed help most, during the great recession, we were losing business to American competitors who were buying electricity at rates 1/2 to 1/3 what we were paying…AND IT WAS SUBSIDIZED BY US!

Further, under this pricing model, users like myself have no incentive to go "off peak" to access lower rates. The

Provincial Benefit calculation clawed back any advantage I had of operating off peak. Today this is effect is amplified even more because the actual electricity portion of our bill subject to “time of use rates” is only 10%-15%of our total bill.

In fact, at the time I discovered that all of this was going on, I poured all of my iron on night shift, attempting to access lower middle of the night electricity prices.

Upon discovering that my efforts were in vain, I immediately shifted all of my production to day shift. By doing this, I avoided shift premiums, extra supervision, and all of the safety, quality and productivity issues that go with running a night shift operation. To this day, The Bowmanville Foundry pours iron on day shift. We make no attempt to run off peak, it does not pay off because the pricing model is broken. IT IS DESIGNED TO PROTECT THE GENERATORS OF ONTARIO, NOT THE RATEPAYERS.

After learning all of this, I immediately called our MPP, John O'Toole, who was the energy critic at the time. I told John the story. His response was "That can't be right", and he would look into it and get back to me.

A few days later, John called me back and said "Not only are you right, it is worse than you think"

He then told me that the Ontario government was also using the funds collected from the Provincial Benefit to fund the programs of the Green Energy Act...they were using the Provincial Benefit to subsidize rich contracts to Wind, Solar

and other alternative electricity developers, and to fund conservation programs.

How rich were these contracts? The Ontario Government was signing 20 year contracts with wind and solar developers for anywhere from 30-80 cents per kwhr. THAT IS 10 to 20 TIMES THE MARKET RATE!

Downtown Toronto law firms were establishing special experts on drafting the proper language and filling in the correct forms for developers to secure these contracts.

There was practically a line up around Queen's Park of people wanting to access these rich contracts...all paid for by industrial ratepayers, who were passing these additional costs on to our customers in the form of price increases and electricity surcharges, and as our prices went up we were in turn losing business and shedding jobs by the tens of thousands.

In time the Provincial Benefit was getting a lot of negative press from some astute reporters who picked up on the story. The government's response was to change the name of the Provincial Benefit to the Global Adjustment…a term many of us are now familiar with.

It gets worse.

Because of our headlong rush into expanding our renewable energy (Wind/Solar) capacity, we now have a serious problem with excess power on Ontario's electrical grid.

In 2014 Ontario produced 19.1 Terawatthours of excess electricity. What is a Terrawatt? It's a trillion watts.

That much excess electricity would have powered 100,000 homes for a year.

The problem is, we can't store electricity, it must go somewhere...and that somewhere is to sell it off to neighbouring jurisdictions. Over the last several years, most of our excess electricity production has been sold in large part to competitors over the border.

For example, in 2014 we spent $1.7 Billion for that 19.1 terawatthours of excess electricity and we sold it to places like Michigan and New York for only $688 million dollars. In other words, we lost just over a billion dollars overproducing electricity and selling it off at fire sale prices.

In 2015, the loss on surplus sales rose to $1.5 Billion

In 2016, the loss on surplus sales rose further to $1.7 Billion

So, this is the bazaar situation Ontario power users find themselves in...

As an industrial power user, we are paying some of the highest industrial rates in North America, largely due to the Global Adjustment which funds the rich contracts that have been handed out for wind and solar power which is surplus and not needed anyway. This excess electricity is sold at a

loss to adjacent US states where our competitors get to enjoy this cheap power...SUBSIDIZED BY US.

IN SUMMARY:

1. **We have a dysfunctional pricing scheme (Global Adjustment) that gives no incentive for electricity producers to match current market prices while at the same time giving large users a disincentive to operate off peak.**
2. **We have contracted for the long term, for power we do not need, at high prices subsidized by our industry, and we are selling it to our competitors at fire sale prices.**

The problem, plain and simple, has been gross mismanagement of the electricity file by the Ontario government. The result has been pink slips.

SUPPORTING DOCUMENTS AND INFORMATION

WIND

In 2007 Ontario had 500 MW of wind capacity

There were about 250 turbines (includes the iconic Exhibition Place turbine) in Ontario

By June 2014 there was about 3,000 MW of wind capacity in commercial operation, and 1,300 turbines (some 500 feet high) in many communities outside the GTA

The Ontario Power Authority has an additional 2,600 MW contracted for under development, which will add another 1,000 turbines in many other Ontario communities

the average price of electricity in 2007 was 5.4 cents/kWh and the average price of electricity in 2014 was 9.5 cents/kWh, a 76% jump from 2007.

The wind power development industry's lobbyist the Canadian Wind Energy Association or CanWEA published an article in its fall edition of the quarterly magazine Windsight, which sets the stage for further activity in Ontario to persuade the voting, tax-paying, rate-paying populace that wind power is "green" and good. The article refers in specific to work done by Nik Nanos, chairman of Nanos Research, "retained by CanWEA to examine the views of consumers on a wide range of energy issues".

This is very timely of course, with Ontario's IESO set to open up its Large Renewable Procurement process for even more wind power, despite the billions lost on selling off surplus power.

Auditor General DRC

Here's what the Ontario Auditor General's report for 2011 said about what Ontario lost by exporting electricity surpluses.

"Based on our analysis of net exports and pricing data from the IESO, we estimated that from 2005 to the end of our audit in 2011, Ontario received $1.8 billion less for its electricity exports than what it actually cost electricity ratepayers of Ontario."

The losses highlighted in the AG's report are related to the creation of the Global Adjustment or GA. The buyers of our surplus electricity only pay the HOEP (hourly Ontario electricity price) and Ontario's consumers pick up the difference between the contracted price for generation and the HOEP. It was that difference, the GA, that the AG's report highlighted.

Ontario has seen three more years of generation since that report and each one has meant increasing costs to Ontario's electricity consumers. For 2012, IESO reported our exports were 14.6 terawatt hours (TWh) and generated an average price of $24.1 million/TWh, but the costs to Ontario's consumers for that generation included the GA which was an additional $49.6 million/TWh—that resulted in a cost of $724 million. 2013 was worse: Ontario exported 18.3 TWh generating $26.5 million/TWh with the GA cost at $59.0 million/TWh for a cost of $1.007 billion. 2014 was slightly worse again, with exports of 19.1 TWh generating $36.0 million/TWh, costing ratepayers $53.5 million/TWh for the GA, creating a loss of $1.022 billion.

So, those three years cost ratepayers $2.75 billion for the 52 TWh (11.3% of total generation of 459.8 TWh) of exported power we didn't need, bringing losses since creation of the GA to $4.550 billion.

Selling off Surplus

2014

ieso data Independant Electricity System Operator

total generation 154 Twh, avg cost 89.5M/Twh, total cost $13.8B

surplus 19.1 Twh biggest receivers were NY and Michigan at around 7.5 Tw each

avg hoep (price) was 3.6 cents/kwh, GA 5.35 cents/Kwh

doing the math...sold 19.1 @ 3.6 $688M

...cost 19.1 @ 8.95 $1.7B

...loss $1.012B

wind 5.2 TW 3.4% of total generation, paid 123M/TWh

solar 1.85 TW 1.2% of total generation, paid 500M/Twh

Total 7Tw cost $1.7B

wind and solar only 4.6% of our capacity, 12% of our costs.

Cost Increases

In 2007 Ontario consumed 152 TWh at a cost of $7.676 billion; in 2014 Ontario's consumption was 139.8 TWh and the cost (including the $1.012 loss on exports) was $13.524 billion—an increase in the cost per TWh of 91% from just 7 years ago.

LTEP projects an increase of 42% 2015 to 2018, a doubling since 2011 levels

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don't forget financial assurance, Windmills

Comparison of jobs

What has Ontario missed out on by having ratepayers subsidizing those exports by $44 million for those seven days?

* the annual salary of 293 family physicians, or

* 580 nurse practitioners, or

* repairing all the Toronto District School Board's school roofs, or

* one and a half days of interest on Ontario's public debt, or

* all of Ontario's 301 MPP salaries for a full year, or

* 40 MRI machines, or

* 100 months of mortgage payments on the empty MaRS Phase 2 building, or

* increasing funding for autistic children by 30% over current levels.

Just a few examples of how the wasted subsidy money that cost each Ontario ratepayer $10 for just one week could have been used!

The union says Ontario has the second-lowest RN-to-population ratio in the country: 668 RNs per 100,000 residents, compared to an average of 785 RNs to 100,000 residents in other provinces and territories.

By: Theresa Boyle Health, Robert Benzie Queen's Park Bureau Chief, Published on Thu Jan 15 2015

The Ontario government is imposing $580 million in cuts on the province's 28,000 doctors after the two sides failed to reach a contract settlement.

DRC and Clean Energy Benefit

TORONTO – Residential consumers will still see their hydro bills go up, even though the governing Liberals are planning to remove the controversial debt retirement charge from their monthly statements in 2016.

The Ontario Clean Energy Benefit, which takes 10 per cent off hydro bills, will also expire at the same time. The majority of ratepayers will also be expected to bankroll a proposed program that would offset energy costs for lower-income families.

According to the government, a typical family consuming about 800 kilowatt hours per month would save about $75.60 a year after taxes once the debt retirement charge is removed on Jan. 1, 2016.

But those savings would be cancelled out by the loss of an $180 annual rebate from the clean energy benefit, which was introduced in 2012.

TORONTO - The typical Ontario residential hydro consumer can expect to see their bills leap by roughly $120 a year in 2016.

Energy Minister Bob Chiarelli announced Wednesday that his government will retire the Debt Retirement Charge (DRC) on hydro bills starting on Jan. 1, 2016, an annual savings of just under $70.

But at the same time, the government intends to bring an end to the Ontario Clean Energy Benefit (OCEB) which takes 10% off bills, adding about $180 to the average family's hydro bill.

Chiarelli said he expects that the dramatic increases in hydro prices will taper off by 2016, meaning less pressure on bills for average families.

The DRC, brought in to pay off leftover debt from the old Ontario Hydro, will continue on business hydro bills until the end of 2018.

If bafflegab were an Olympic sport, Chiarelli would take the gold medal.

"There will still be increases in electricity rates moving forward, but we have increased very significant mitigation measures by the actions we've taken and also by these announcements today," he told reporters.

"I will refer to the budget when it's released in terms of some of the initiatives that are being brought forward, including price mitigation and initiatives around energy sustainability and the integrity of our energy supply and the investments we are making to support a vibrant industry.

"And we have to be competitive," Sousa said.

Sounds like a whole heapin' helpin' of bafflegab to me.

DRC and General

Chiarelli also muddled the two issues of the stranded debt and the DRC. The original stranded debt of Ontario Hydro was around $19 billion. But the amount allocated to be paid down by the DRC was $7.8 billion.

Tory Leader Tim Hudak dismissed Chiarelli's plan as pre-election posturing -- noting that none of the Liberals' pre-budget promises kicks in until 2015.

"Do you think they actually have the intention of delivering on them or are they just trying to skate through the next budget and buy the NDP support?" he asked.

Hudak says the debt's been paid off.

"There was about a $9-billion debt to be paid down, and hydro customers have already paid $12 billion towards it. That doesn't sound like a good deal for taxpayers," he told QMI Agency in an interview.

The DRC, which is calculated based on consumption, was introduced in 1998 to help pay down the debt left over from Ontario Hydro, the former Crown corporation that was split into five companies.

Ontario Power Generation, Hydro One and municipal utilities were responsible for servicing and retiring part of the debt, while consumers were to pay off the residual stranded debt – amounting to $7.8 billion in 1999 – through the DRC.

In his 2011 report, then-auditor general Jim McCarter noted that the original amount of debt the DRC was intended to pay off was $7.8 billion, yet there was still a balance, even though the government had collected $8.7 billion by March 31, 2011.

McCarter's successor, Bonnie Lysyk, said last year that the amount collected has grown to $10.6 billion as of 2013 — even though the government claims there's still $3.9 billion owing.

EXPLAINER

Why does Ontario's electricity cost so much? A reality check

Ontarians pay steeper rates for their power than any other province, and a decade's worth of policy choices have made it that way. Adrian Morrow and Tom Cardoso address the key questions about how we got here and what the province could do to fix it

PHOTOS.COM

ADRIAN MORROW AND TOM CARDOSO

GLOBE AND MAIL UPDATELAST UPDATED: THURSDAY, JAN. 19, 2017 12:11AM EST

- 231 Comments

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Electricity prices in Ontario have soared in the past decade. Since 2006, the top rate for power has risen four times as fast as inflation.

The problem has aggravated voters, piled on costs for business – particularly factories and other industrial enterprises – and remained one of the most persistent hot buttons for the province's politicians.

Facing record-low approval ratings, Premier Kathleen Wynne last September announced an 8-per-cent subsidy for residential and small-business bills, which took effect Jan. 1.

How did we get here? How high are electricity prices exactly? How does Ontario compare with other jurisdictions? And what can we do to drive rates down?

The short answer is that a series of policy decisions – most significantly, upgrading infrastructure and signing fixed 20-year deals with private companies to produce electricity – have increased prices over the past decade.

It hasn't helped the government that a series of controversial decisions, such as cancelling two gas-fired power plants for political reasons and privatizing Hydro One, have intersected with electricity policy and attracted blame for the high prices. While the cancellation of the plants has driven up rates, it's a relatively small part of the overall increase; the Hydro One privatization, meanwhile, has not yet had an effect.

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How much do Ontarians pay for power?

Ontario's electricity prices are far higher than those in the rest of the country. Quebec, for example, enjoys rates less than half of those in Ontario. The international picture is more complicated. Ontario rates are generally significantly lower than those across the border in New York and about half what Germans, Danes or Italians pay.

The bad news, for consumers and the government, is that rates likely will not be coming down any time soon.

Use our calculator to find out how much you'd pay for your monthly electricity bill in cities across Canada and the U.S.

I live in a

in

that is roughly square feet

CALCULATE

THE GLOBE AND MAIL, SOURCE: NATURAL RESOURCES CANADA AND HYDRO-QUÉBEC

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How high are electricity prices exactly?

Ontario consumer price index, electricity vs. all items

Electricity
All items
8010012014016018020 0Indexed, 2002 = 100Indexed, 2002 = 100200420062008201020122014201698.8102.9

THE GLOBE AND MAIL, SOURCE: STATSCAN

DATA

SHARE

×

Date	Electricity	All items
2003-10-01	98.8	102.9
2003-11-01	95.1	103.1
2003-12-01	98.8	103.4
2004-01-01	98.8	103.4
2004-02-01	98.8	103.6
2004-03-01	98.8	104
2004-04-01	104.4	104.1
2004-05-01	104.4	105
2004-06-01	104.4	104.8
2004-07-01	104.4	104.9
2004-08-01	104.4	104.7
2004-09-01	104.4	104.8
2004-10-01	104.4	105
2004-11-01	104.4	105.4
2004-12-01	104.4	105.3
2005-01-01	104.4	105.1
2005-02-01	104.4	105.8
2005-03-01	104.4	106.4
2005-04-01	111.3	106.5
2005-05-01	111.3	106.6
2005-06-01	111.3	106.8
2005-07-01	111.3	106.9
2005-08-01	111.3	107.5

2005-09-01	111.3	108.2
2005-10-01	111.3	107.7
2005-11-01	110.6	107.5
2005-12-01	107.7	107.6
2006-01-01	110.6	108.2
2006-02-01	110.6	107.9
2006-03-01	110.6	108.8
2006-04-01	110.6	109.1
2006-05-01	122.8	109.5
2006-06-01	122.8	109.3
2006-07-01	121.7	109
2006-08-01	121.7	109.1
2006-09-01	121.7	108.5
2006-10-01	121.7	108.4
2006-11-01	115.8	108.6
2006-12-01	115.8	108.8
2007-01-01	115.8	108.6
2007-02-01	115.8	109.7
2007-03-01	115.8	110.8
2007-04-01	115.8	111.1
2007-05-01	116.7	111.6
2007-06-01	116.7	111.1
2007-07-01	116.7	111.1
2007-08-01	116.7	110.9

2007-09-01	116.7	111
2007-10-01	116.7	110.9
2007-11-01	111.6	111.2
2007-12-01	111.6	111.1
2008-01-01	110.5	110.9
2008-02-01	110.5	111.4
2008-03-01	110.5	111.7
2008-04-01	110.5	112.5
2008-05-01	111	113.6
2008-06-01	111	114.2
2008-07-01	111	115.1
2008-08-01	111	114.8
2008-09-01	111	115.1
2008-10-01	111	113.7
2008-11-01	114.9	113.5
2008-12-01	114.9	112.8
2009-01-01	114.9	112.4
2009-02-01	114.9	113.1
2009-03-01	114.9	113.7
2009-04-01	114.9	113.2
2009-05-01	120.1	114
2009-06-01	120.1	114.2
2009-07-01	120.1	113.7
2009-08-01	120.1	113.7

2009-09-01	120.1	113.8
2009-10-01	120.1	113.9
2009-11-01	119.3	114.6
2009-12-01	119.3	114.1
2010-01-01	119.3	114.5
2010-02-01	119.3	115.1
2010-03-01	119.3	115.3
2010-04-01	119.3	115.7
2010-05-01	130.9	116.2
2010-06-01	130.9	116
2010-07-01	140.9	117
2010-08-01	140.9	117
2010-09-01	140.9	117.1
2010-10-01	140.9	117.8
2010-11-01	136.8	118
2010-12-01	136.8	117.9
2011-01-01	131.7	117.8
2011-02-01	120.6	118
2011-03-01	123.1	119.4
2011-04-01	123.1	119.9
2011-05-01	130.5	120.9
2011-06-01	130.5	120.2
2011-07-01	130.5	120.5
2011-08-01	131.2	120.6

2011-09-01	131.2	121.1
2011-10-01	131.2	121
2011-11-01	131.5	121
2011-12-01	131.5	120.3
2012-01-01	131.5	120.6
2012-02-01	131.3	121.4
2012-03-01	131.3	122
2012-04-01	131.3	122.4
2012-05-01	140.3	122.4
2012-06-01	140.3	121.6
2012-07-01	140.3	121.4
2012-08-01	140.7	121.8
2012-09-01	140.7	122
2012-10-01	140.7	122.2
2012-11-01	139.2	121.9
2012-12-01	139.4	121.3
2013-01-01	139.3	121.3
2013-02-01	139.9	122.8
2013-03-01	139.9	123.2
2013-04-01	139.9	122.9
2013-05-01	144.8	123
2013-06-01	144.8	123.2
2013-07-01	144.8	123.4
2013-08-01	144.8	123.4

2013-09-01	144.8	123.5
2013-10-01	144.8	123.3
2013-11-01	150.5	123.3
2013-12-01	150.5	123.1
2014-01-01	151.4	123.3
2014-02-01	151.3	124.6
2014-03-01	151.5	125.1
2014-04-01	151.7	125.9
2014-05-01	156.5	126.5
2014-06-01	156.5	126.9
2014-07-01	156.5	126.5
2014-08-01	156.5	126.5
2014-09-01	156.5	126.7
2014-10-01	156.5	126.8
2014-11-01	159	126.3
2014-12-01	159	125.4
2015-01-01	159	125.3
2015-02-01	159.9	126.2
2015-03-01	159.9	127.1
2015-04-01	159.9	126.9
2015-05-01	167.7	127.7
2015-06-01	167.7	128.2
2015-07-01	167.7	128.4
2015-08-01	167.9	128

2015-09-01	167.9	127.8
2015-10-01	167.9	127.9
2015-11-01	173.2	127.9
2015-12-01	173.2	127.5
2016-01-01	185.1	127.8
2016-02-01	185	128.2
2016-03-01	187.8	129
2016-04-01	187.8	129.6
2016-05-01	193.5	130.1
2016-06-01	193.5	130.4
2016-07-01	193.5	130.3
2016-08-01	193.5	129.9
2016-09-01	193.5	130.1
2016-10-01	193.5	130.6
2016-11-01	192.6	130.2

ONTARIO CONSUMER PRICE INDEX, ELECTRICITY VS. ALL ITEMS
DOWNLOAD CSV

https://s3.amazonaws.com/chartstg/mXttosbo9zj7R4y6w/thumbnail.png

In November, 2006, when the Ontario Energy Board set the first new rates after a four-year freeze, off-peak electricity cost 3.5 cents a kilowatt hour, mid-peak power cost 7.5 cents a kilowatt hour and on-peak, when juice is most in demand, was 10.5 cents a kilowatt hour. The current rates, set in November, 2016, are 8.7 cents, 13.2 cents and 18 cents.

That means the price of off-peak power has rocketed up 149 per cent over a decade, mid-peak power has shot up 76 per cent and on-peak is up 71 per cent. By way of comparison, inflation in Ontario over the same period was about 18 per cent.

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Where does Ontario's power come from?

Ontario's power generation infrastructure
Nuclear (3 plants)
Hydroelectric (133)
Natural gas (33)
Biomass (11)
Wind (36)

7,000 MW
capacity
1,000
100
10

Thunder Bay
Ottawa
Toronto

Southwestern Ontario detail

Note: Data last updated by the Canadian Electricity Association on Jan. 3, 2013.
Capacity scale applies only to main map.
THE GLOBE AND MAIL, SOURCE: CANADIAN ELECTRICITY ASSOCIATION

Despite the colloquial use of the term “hydro” as a synonym for electricity in Ontario, the province actually uses a mix of sources – not just hydroelectric dams – to get its power.

By far, the largest source of electricity in Ontario is nuclear, accounting for about 60 per cent of the electricity produced in 2015. The province has three nuclear plants: the government-run Darlington and Pickering nuclear generating stations, east of Toronto, and the Bruce Nuclear Generating Station, on Lake Huron, which is run by the private company Bruce Power.

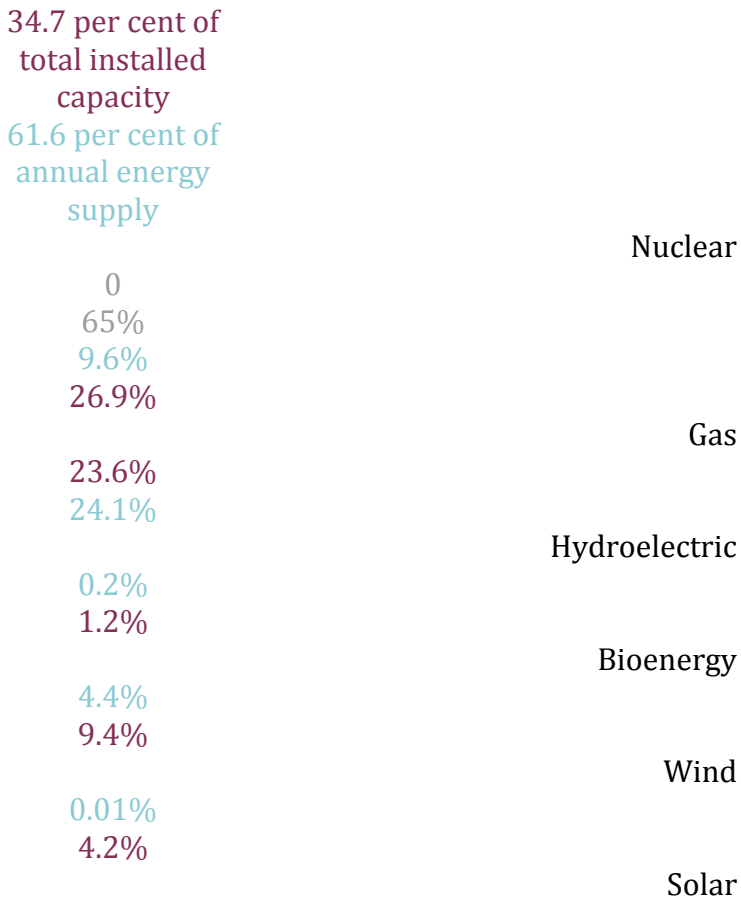
The second-largest source is hydroelectricity, which accounted for 24 per cent of generation in 2015, followed by natural-gas plants (10 per cent) and wind power (6 per cent). Biofuel (which essentially means burning wood pellets) and solar power each provided less than 1 per cent of the province’s power supply.

Generally speaking, the power supply can be divided between “baseload” and “peaking” power. The baseload generation is typically running all the time to provide a steady supply that the province always needs. Peaking power is only switched on when needed.

This difference is what accounts for the gap between installed capacity and actual production. For example, nuclear power (which is part of the baseload) accounts for just 36 per cent of the province’s installed capacity (i.e., the province’s total generating power) but actually produces 60 per cent of the supply. Natural gas, which is mostly used for peaking, accounts for 28 per cent of installed capacity but produces just 10 per cent of the supply.

Ontario's 2014 installed energy capacity vs. actual annual supply, by source

While a third of Ontario's capacity is nuclear, almost 60 per cent of the electricity Ontarians consume comes from nuclear power plants, meaning nuclear plants are running non-stop while some other power sources (particularly gas plants) often go unused.
Per cent of total installed capacity
Per cent of total energy supply



Note: Numbers may not add up to 100% due to rounding.
THE GLOBE AND MAIL, SOURCE: IESO

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How is the system organized? Who sets the rates?

Cost components of Ontario's electricity system, 2014

$19-billion

Generation
$11.8-billion
62.1% of total

Distribution
(e.g. the local utility)
$3.4-billion
17.9%

Transmission
(e.g. Hydro One, for the most part)
$1.6-billion
8.4%

Debt retirement
(goes towards paying down the leftover debt from Ontario Hydro)
$1.0-billion
5.3%

Regulatory
(miscellaneous expenses, such as keeping the IESO operating)
$900-million
4.7%

Conservation programs
$300-million
1.6%

THE GLOBE AND MAIL, SOURCE: OFFICE OF THE AUDITOR GENERAL OF ONTARIO

Ontario's electricity system is a tangle of public, private and semi-private companies. Roughly speaking, you can break it into three major components: generation (producing the power), transmission (getting the power across the province through high-voltage lines) and distribution (piping the power into homes and businesses.)

Generation includes more than 200 power plants ranging from the massive Bruce Nuclear Generating Station – an eight-reactor station that pumps out almost a third of the province's power supply – to tiny solar operations consisting of a few panels. Some generation is handled by government-owned

Ontario Power Generation, which runs the Darlington and Pickering nuclear power plants and a slew of hydroelectric facilities. Other generation is done by private companies, including most of the province's gas plants and wind farms. The Bruce plant is also private, run by Bruce Power, a company co-owned by TransCanada Corp., a municipal employees' pension plan and two unions.

Transmission is primarily handled by Hydro One, a government company that is in the process of being privatized. Hydro One's job is to take the power from the various plants and get it to where it's needed. In 2015, Ms. Wynne unveiled a plan to sell 60 per cent of Hydro One in a bid to raise $4-billion to fund her transit plans and $5-billion to pay down debt. So far, the government has sold 30 per cent of the company on the stock market.

In some places, Hydro One handles distribution itself. In others, this task is done by a local utility, such as Toronto Hydro, Horizon Utilities or Hydro Ottawa. Utilities are typically owned by municipal governments, but sometimes have private shareholders as well.

The entire system is overseen by the Independent Electricity System Operator, a government agency that roughly acts as the co-ordinating body to make sure enough power is getting produced and shipped around to meet demand.

The Ontario Energy Board sets rates for electricity twice a year, based on submissions from the various companies and agencies.

The province's Ministry of Energy, meanwhile, makes big-picture decisions about the system and sets overall policy.

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What about Ontario Hydro? Isn't that still a thing?

For much of the 20th century, most of the province's electricity generation and transmission were overseen by a single government agency with the snappy name of Hydro-Electric Power Commission of Ontario (better known by its 1970s rebranding as Ontario Hydro). In 1999, the Progressive Conservative

government of Mike Harris broke Ontario Hydro into Ontario Power Generation, Hydro One and various other agencies as part of a plan to privatize most of the system. The Tories eventually abandoned their privatization plan, but the new structure remained.

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Why is electricity so expensive?

Today's high prices are largely the result of provincial policy decisions made during the 2000s.

When the Ontario Liberal Party came to power in 2003, the province's electricity grid was aging and creaky, and Ontario had to import power to meet its needs. The province was also haunted by the memory of Ontario Hydro's disastrously overbudget nuclear construction projects in the 1980s and 90s. What's more, the Liberals had been elected in part on a promise to close down the province's coal-fired power plants.

So the government went on a building spree, upgrading aging infrastructure and commissioning new natural gas, wind and solar plants to replace the coal plants.

But, wary of the previous cost overruns at Ontario Hydro, the government decided to outsource the work of building and running the new power plants to the private sector. The private sector would be responsible for cost overruns and other construction problems in exchange for 20-year contracts from the province. The contracts essentially guaranteed that the companies would receive a certain amount of revenue – no matter how much electricity their plants produced (though they would be paid more if the province used their electricity).

The first major wave of private power plants was fuelled with natural gas. Later plants were tied to the Green Energy Act, which provided lucrative terms for wind and solar plants in a bid to build a renewable-power industry in the province. One of the most famous deals was a sole-source contract with a

Samsung-led consortium, which included locating factories building green-energy equipment in the province.

The cost of all this is passed on to ratepayers in the form of higher electricity bills. Auditor-General Bonnie Lysyk estimates that the “global adjustment charge” – the government’s term for the costs in the system above the market rate for electricity – accounts for some 70 per cent of the average electricity bill.

Ultimately, the province built more plants than it actually needed. In 2014, according to the Auditor-General, Ontario had the capacity to produce 30,203 megawatts of power – but only needed 15,959 on an average day. (Even on the busiest day of the year, the province only required 22,774 megawatts.)

Ontario’s available capacity vs. actual demand
Average demand
Peak demand
Available resources
05101520253035In gigawattsIn gigawatts2009201020112012201320142014201415.9622.7730.20
THE GLOBE AND MAIL, SOURCE: OFFICE OF THE AUDITOR GENERAL OF ONTARIO
DATA
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Year	Average demand	Peak demand	Available resources
2009	15.886	24.380	30.240
2010	16.232	25.075	29.030
2011	16.150	25.450	29.845
2012	16.085	24.636	28.603
2013	16.066	24.927	30.278
2014	15.959	22.774	30.203

ONTARIO’S AVAILABLE CAPACITY VS. ACTUAL DEMAND
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At the same time, demand for electricity in the province fell, partly because of the recession and the long-term upheaval in the manufacturing sector and partly because of government efforts to encourage Ontarians to conserve power.

So the province has a massive surplus of generating capacity, but because much of it is tied up in private, 20-year contracts, Ontarians have to pay for all that electricity – whether they need it or not.

In some cases, the province also made the situation worse with political meddling. Ahead of the 2011 election, for instance, then-premier Dalton McGuinty cancelled two unpopular natural-gas plants in Liberal-held ridings in Toronto suburbs and gave the companies new contracts to build plants in other locations – farther from the areas that would need the electricity. As a result, ratepayers ended up on the hook for another $1.1-billion.

And Ontarians are still paying for the nuclear plants Ontario Hydro built in the eighties and nineties. When Ontario Hydro was broken up, its debt was hived off into an item called the “stranded debt,” which is being paid down by electricity users.

In 2015, Ms. Lysyk calculated that Ontarians had paid $37-billion more than market price for electricity from 2006 to 2014 and would pay another $133-billion extra by 2032.

Some of this cost was unavoidable: The province has to pay for fixed contracts that guarantee Ontarians have access to a steady supply of power. But there is no doubt, given the vast amount of surplus generating capacity, that the province has overpaid unnecessarily.

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What about the privatization of Hydro One? Is that going to make electricity more expensive too?

The short answer: Maybe, but it's debatable.

The long answer: Hydro One hasn't been (semi-)privatized long enough to see what the effect on rates will be.

Opponents of privatization argue that it will ultimately drive up prices because a private company, eager to satisfy shareholders, will be more aggressive than a government agency when it comes to pressuring the Ontario Energy Board into granting rate increases. For example, they argue, a privatized Hydro One could be tempted to defer major infrastructure repairs (replacing aging transmission lines, for instance) in a bid to wring more money out of the company for shareholders, then offer to make the repairs in exchange for a rate increase. A government-owned agency would have a much harder time doing this because of the political backlash from angry consumers. Supporters of privatization, meanwhile, contend that private owners will be more motivated to push for efficiencies within the company, which could then be passed on to consumers.

Either scenario is possible, and it's hard to know which will play out until the company has been privatized for a few years.

In the short term, however, the privatization has become a political problem for the Liberals. Polls show the vast majority of Ontarians believe Hydro One should remain publicly owned, and Liberal insiders concede their opponents, particularly the NDP and the unions, have done an effective job of blaming the privatization for high hydro prices – even though there is currently no connection.

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What will happen to prices over time?

Under the government's current projections, electricity prices will keep going up for the foreseeable future. The most recent projection, the 2013 Long-Term Energy Plan, estimated that the average monthly household bill would rise to $210 in 2032 from $138 in 2013 – a 52-per-cent increase. The province is in the middle of preparing the next Long-Term Energy Plan, which will contain an updated projection.

Typical monthly residential electricity bill, forecasted

120140160180200$220201320162019202220252028203113 8

THE GLOBE AND MAIL, SOURCE: ONTARIO MINISTRY OF ENERGY

DATA

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Year	Average residential household's electricity bill
2013-01-01	138
2014-01-01	152
2015-01-01	162
2016-01-01	167
2017-01-01	170
2018-01-01	178
2019-01-01	177
2020-01-01	181
2021-01-01	187
2022-01-01	193
2023-01-01	188
2024-01-01	191
2025-01-01	194

2026-01-01	198
2027-01-01	200
2028-01-01	202
2029-01-01	204
2030-01-01	205
2031-01-01	207
2032-01-01	210

TYPICAL MONTHLY RESIDENTIAL ELECTRICITY BILL, FORECASTED
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There are a few reasons (besides inflation) electricity prices won't likely be coming down any time soon. For one, there are all those long-term contracts; 20-year deals with private power companies add costs to the system. What's more, the province's nuclear plants are being refurbished over the next 15 years, which will add long-term costs as well.

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How does Ontario compare with other jurisdictions?

83.35

Edmonton

83.32

Vancouver

74.40

Winnipeg

65.11

Montreal

55.02

Note: Based on 750 kWh of monthly usage. Excludes any applicable taxes. U.S. dollar conversion uses the exchange rate from April 1, 2016.

THE GLOBE AND MAIL, SOURCE: ONTARIO ENERGY BOARD

By Canadian standards, Ontario's electricity is ridiculously expensive.

By international standards, it's not so bad.

The province's two Canadian neighbours – Quebec and Manitoba – enjoy electricity prices that are about half what Ontario pays. The main reason: geography. Both Quebec and Manitoba have abundant hydroelectric power, which allows them to generate more than 98 per cent of their electricity from water (compared with 24 per cent in Ontario). This has allowed those provinces to (mostly) avoid both the costly and complicated process of building nuclear plants, which Ontario undertook from the 1960s to the 90s, and the phase-out of coal-fired powered plants that dominated the 2000s.

Other provinces also generally have cheaper electricity than Ontario for a variety of reasons. For one, no other province has ever undertaken a nuclear build on the scale Ontario has (New Brunswick is the only other province that uses nuclear power; Quebec once had a single, relatively small nuclear plant, which shut down in 2012). Some other provinces, notably Alberta and Saskatchewan, get most of their electricity from coal-fired power plants (although Alberta is looking to replace coal with natural gas, wind and solar).

Internationally, however, Ontario's price situation looks a lot better. Electricity in New York is more expensive, despite a fairly similar supply mix – the state uses nuclear power, though somewhat less of it; natural gas, though somewhat more of it; and continues to burn coal. In Europe, prices are even higher, with France and Britain both paying more than Ontario; and in the case of Germany, Italy and Denmark, prices are double or more what they are in Ontario.

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What is the government doing about it? What can be done?

In the past four years, Ms. Wynne's government has made several changes to the system in a bid to ease price increases.

The most significant was a decision in 2013 to stop building more nuclear reactors. The same year, the province also renegotiated the deal for wind and solar power from the consortium led by Samsung, which took $3.7-billion in costs out of the system by scaling back the amount of electricity the consortium would produce.

The government has also taken smaller actions, including buying hydroelectric power from Quebec at a lower price than it would have cost to generate the same power from natural-gas plants, saving about $70-million over seven years.

Most recently, Ms. Wynne went for the quicker fix of slashing bills by 8 per cent with a taxpayer subsidy. But the subsidy is controversial. For one thing, because taxpayers and ratepayers largely overlap, it effectively asks most Ontarians to subsidize their own power bills – to the tune of about $1-billion a year; for another, it's regressive, as it disproportionately helps wealthier people with larger homes that use a lot of electricity.

There is relatively little the government can do to lower rates through more lasting, structural means, mostly because the Liberals have tied up so much of the system in 20-year contracts. Progressive Conservative Leader Patrick Brown, however, has promised to take a closer look at the deals to see if any can be renegotiated if and when he becomes premier.

Other possible solutions face problems of their own. While some politicians, particularly in the NDP, advocate buying more hydroelectricity from Quebec instead of refurbishing the province's nuclear plants, doing so would require a lot of money to upgrade the transmission infrastructure.

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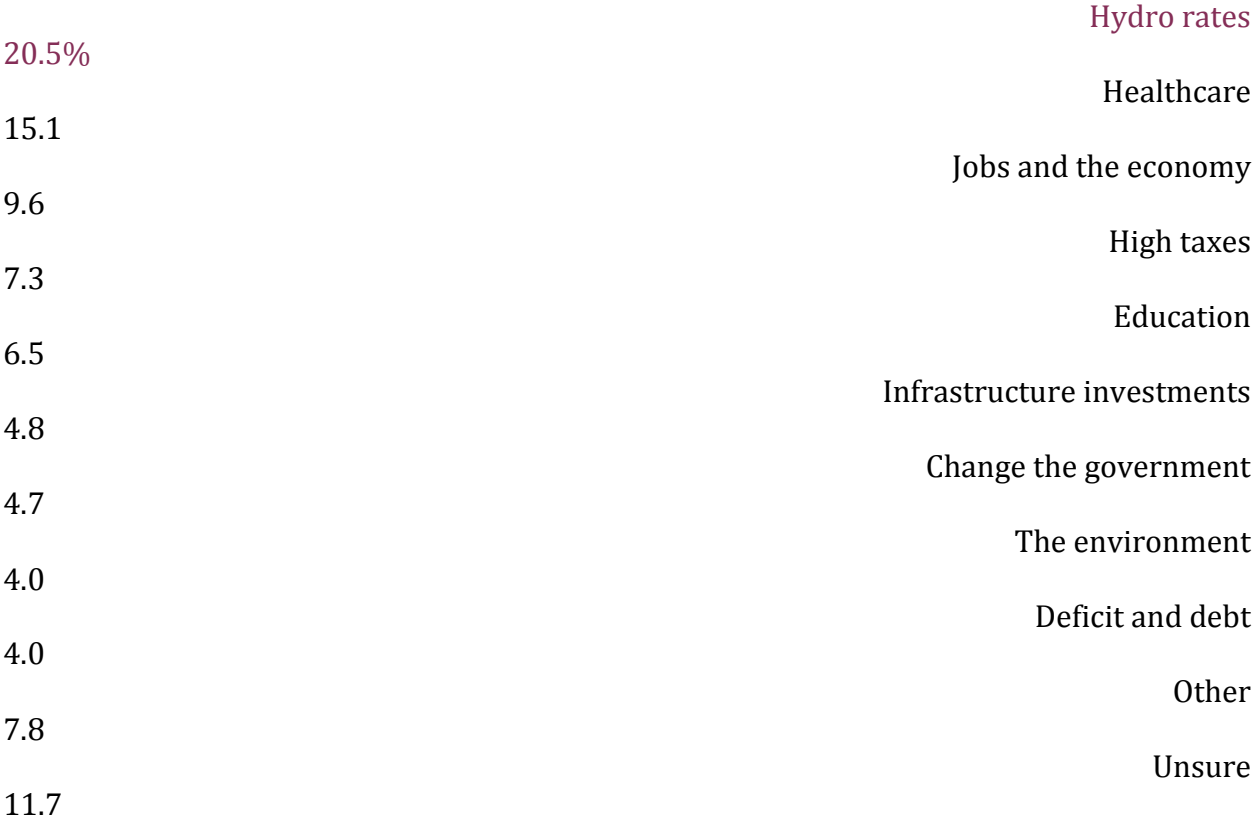
What are the political ramifications here?

Survey question: What is your most important provincial issue of concern?
Random telephone survey of 500 Ontarians, conducted Nov. 15 to Nov. 19, 2016



Accurate to within 4.4 percentage points, 19 times out of 20.
THE GLOBE AND MAIL, SOURCE: NANOS RESEARCH

Electricity prices seem to have reached a tipping point in the public's consciousness over the past couple of years. A poll last month by Nanos Research showed that, astonishingly, more voters named electricity as their top issue, unprompted, than any other public-policy concern – beating out perennial favourites health care, jobs and taxes.

The governing Liberals have trailed the opposition PCs in the polls for two years, and Ms. Wynne's approval rating has sunk to record lows (as far down as 13 per cent, according to one Forum poll). There may be multiple reasons for that – a string of ethics scandals certainly hasn't helped – but the Liberals themselves are convinced that electricity prices are killing them at the polls.